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(54) Pressure-sensitive silicone adhesives

Druckempfindliche Klebstoffe auf Basis von Silikon

Adhésifs sensibles à la pression à base de silicone

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Description

BACKGROUND OF THE INVENTION

Solventless and high solids silicone pressure sensitive adhesives provide excellent cure, peel and tack adhesion properties on polyester, polyimide, and polytetrafluoroethylene tapes. However, some cured PSA tapes have a high affinity to the back side of adhesive tapes. This affinity is undesirable since it leads to difficulties in unwinding and slitting operations and inconsistency in tape appearance upon dispensing. This phenomenon is most apparent with adhesives having a polyester backing.

Some specific compositions which are curable to produce pressure sensitive adhesives, display this high affinity to the backside of adhesive tapes. In particular, these compositions include recently developed solventless or low solvent-containing organopolysiloxane compositions which comprise by weight: (A) from about 50 to about 75 parts by weight of a toluene and benzene soluble, resinous copolymer comprising $R_3SiO_{1/2}$ units and $SiO_{4/2}$ units wherein R is a monovalent hydrocarbon radical having from 1 to 6 carbon atoms; (B) an alkenyl-terminated polydiorganosiloxane; (C) an organohydrogenpolysiloxane compatible with the mixture of (A) and (B); (D) a catalytic amount of a hydrosilation catalyst; and (E) from 0 to about 40% by weight of an organic solvent.

Other specific compositions having such high backside affinities include compositions of the type described above which further comprise a hydrogen-containing polydiorganosiloxane containing more than two silicon-bonded hydrogen atoms per chain and being present in an amount such that (D) has a silicon-bonded hydrogen content of from about 10 to about 100 mole % based on the total silicon-bonded hydrogen content of (C) and (D).

When dispensing tapes having compositions of these types, the dispensing angle affects the surface smoothness and optical quality of the removed tapes. When dispensing a polyester-backed silicone adhesive at 180° angle, a substantially clear, smooth undistorted adhesive tape can be obtained. However, at 90°, a more common dispensing angle, a relatively hazy, roughened tape is obtained. To adhesive tape manufacturers and users, it is desirable to have silicone pressure sensitive adhesives which can be dispensed with little caution using available equipment and settings and still obtain a smooth surface and minimal distorted optical characteristics.

Therefore, it is desirable to develop methods and compositions curable to form silicone adhesives with improved resistance to distortion and haze upon removal from a finished tape roll, regardless of the dispensing angle.

US-A-4978696 discloses liquid organosiloxane compositions containing from 0.1 to about 2 weight percent of a low molecular weight polymethylvinylsiloxane cure by a hydrosilylation reaction to form adhesives that are sufficiently flexible to retain cohesive bonding between substrates exhibiting different coefficients of thermal expansion when the resulting composite is exposed to variations in temperatures during use. The flexibility of the cured adhesive is further increased by addition to the curable compositions of a liquid polydimethylsiloxane having a silanol group at one of the two terminal positions and a triorganosiloxy group at the second terminal position. Preferred compositions are packaged in at least two parts, with the organohydrogensiloxane and the hydrosilylation catalyst being located in different parts of said composition.

SUMMARY OF THE INVENTION

According to the present invention, distortion and haze upon removal can be minimized by incorporating a small amount of chemically compatible, high molecular weight silicone polymer release modifier to the curable PSA compositions discussed above.

When compared to similar compositions without the release modifier, a cured silicone PSA with much less distortion, a smoother surface, and clearer optics is obtained upon removal or dispensing.

According to an embodiment of the present invention, the clean and smooth removal properties of the cured silicone PSA tapes can be adjusted by choosing the type and amount of release modifier in the curable silicone pressure-sensitive compositions.

According to another embodiment of the present invention, a useful control removal additive

a) is chemically miscible with curable compositions of MQ resin/hydride systems and vinyl fluids and/or cross-linker,
b) has a minimal viscosity temperature or an approximate molecular weight of 30,000,
c) does not interfere Pt-catalyzed, addition-cure reaction chemistry, and
d) is stable in the cured pressure-sensitive adhesive compounds.

The present invention provides a pressure sensitive adhesive, having improved control removal properties, said adhesive comprising a resin/organopolysiloxane composition curable to produce a pressure sensitive adhesive said organopolysiloxane composition curable to produce a pressure sensitive adhesive comprising about 50 to about 75 parts by weight of a benzene toluene-soluble siloxane resin, about 25 to about 50 parts by weight of vinyl- and hy-

dride-containing organopolysiloxanes, a Pt catalyst, and from 0 to about 40 weight percent organic solvent and from about 0.5 to about 15 weight percent based upon the resin/organopolysiloxane composition of a chemically compatible high molecular weight organopolysiloxane having the general formula :

$$RR^1{}_2SiO(R^1{}_2SiO)_x(RR^2SiO)_ySiR^1{}_2R \quad (1)$$

wherein each R^1 is independently an alkyl or aryl group having from 1 to about 10 carbon atoms, each R^2 is independently an alkyl or aryl group having from 1 to about 10 carbon atoms, each R is independently chosen from R^1 or R^2, x is an integer, and y is an integer, x and y having values such that the chain-length dependent viscosity of the chemically compatible high molecular weight polyorganosiloxane is at least 1500 mPa.s (cps) at 25°C.

DESCRIPTION OF THE INVENTION

The organopolysiloxanes used in the present invention are useful as release modifiers and are effective in compositions suitable for forming a pressure-sensitive adhesive. About 0.5 to 15 weight percent, preferably 2 to 10 weight percent of modifier,based on the amount of curable PSA composition, can be added to these high solids and solventless curable compositions to facilitate an easy and smooth removal from the backside of an adhesive tape. The release modifier minimizes distortion and roughening of the cured silicone PSA surface upon removal (unwinding) or dispensing.

Organopolysiloxanes useful in the present invention have the general formula :

$$RR^1{}_2SiO(R^1{}_2SiO)_x(RR^2SiO)_ySiR^1{}_2R$$

wherein each R^1 and R^2 is independently an aryl or alkyl group having from 1 to about 10 carbon atoms, each R is independently chosen from R^1 or R^2; x and y are each an integer such that the value of (x + y) is sufficient to yield a composition having a viscosity of from at least 1500 mPa.s (cps) at room temperature to as high as the viscosity of silicone gums, preferably a viscosity of 10,000 mPa.s (cps) or above. Depending upon the types of R and its presence in the chain, compositions expressed in the above formula can be identified structurally as homopolymer, or copolymers of random, alternating or block chain structures consisting of the repeating units. The compositions should be chemically miscible with the mixture of MQ resin, silicone fluids and polymers as taught in the prior art.

This control removal additive organopolysiloxane was found to be effective in compositions as described in the Background of the Invention, particularly those having from about 50 to about 75 parts of a benzenesoluble silicone resin and about 25 to about 50 parts of vinyl- and hydride-containing organopolysiloxanes. The weight percentage of the control removal additive organopolysiloxane is based upon 100 parts by weight of the resin and the vinyl- or hydride-containing organopolysiloxane mixture. The compositions further include a Pt-catalyst, and from 0 to 40 weight percent organic solvent.

These organopolysiloxanes were also found to be effective in compositions as described in the Background of the Invention, particularly those curable compositions having relatively low viscosity at high solids or solventless state, for example, a viscosity of 200,000 mPa.s (cps) at 25°C at 94% solid.

The effectiveness of organopolysiloxanes as release modifiers does not depend on a particular type of curing reaction or mechanism leading to useful adhesive matrix, nor does it depend on particular curing conditions such as cure temperature or cure time, so long as a satisfactory cure is achieved. It is not critical whether curing reaction is an addition reaction between silicon hydride and alkenyls of silicones or condensation reactions between silanol group and silicon hydride or among silanol groups contained within.

To better describe "control removal" property and its effect on the appearance of a cured PSA property, a method was developed to describe the optics and the smoothness of adhesive tapes. The compositions below were applied over a 25.4 µm (1 mil) polyester film and cured to form a 38.1 to 50.8 µm (1.5 to 2 mil) silicone adhesive layer. Then the cured adhesive film was pressed against a cleaned stainless steel plate using a 2.04 kg (4.5 pound) rubber roll. After 20 minutes, the tape was removed at 90° and 180° angles, respectively, relative to the plate. The removed adhesive tapes were subjected to a % haze measurement using a Gardener colorimeter. The % haze value of the untested adhesive was also measured and used as a standard. The reported % haze is the difference between the tested value and the standard value, which reflects the net change in % haze due to mechanical dispensing or removal. The lower the value, the less distortion and better removal property of a cured adhesive.

EXAMPLE 1 - Preparation of Component Mixtures

High solids (e.g. 95%) mixtures curable to form silicone pressure-sensitive adhesives were prepared comprising MQ resin having the units $R_3SiO_{1/2}$ (or M) and SiO_2 (or Q) at a ratio of about 0.7, and about 2 weight percent of silicon-bonded hydroxy group. Component A comprised 58 weight percent MQ resin and 42 weight percent fluid made by mixing 279 gms of an MQ resin which is 60% solid in 40% toluene by weight, with 121 gms of vinyl-stopped dimethylsilicone ($M"D_{105}M"$) fluid, and 0.40 gms of Kardstadt Pt-catalyst (5 % Pt). The mixture was then vacuum stripped to

remove toluene solvent to obtain 95% solid or solventless mixture.

Similarly, Component B was made to a weight ratio of 58 weight percent MQ resin to 42 weight percent hydride-stopped $M^HD_{121}M^H$ silicone fluid by mixing 193 gms of the 60% solids MQ resin with 84 gms of the hydride stopped silicone fluid. The volatile solvent was then removed through a vacuum stripper at a temperature of 70°C or less. Then, 1.77 gms of dimethyl maleate inhibitor and 2.77 gms of a methylhydrogen silicone fluid of the approximate structure, $M^HD_{20}D^H_3M^H$, having a hydride equivalent weight (HEW) of 625 was added. The resultant Component B had an averaged HEW of 3796.

EXAMPLE 2 - Modifier-Free Composition

A composition without having any modifier was prepared by mixing 10.0 gms of Component A, shown in Example 1, with 14.25 gms of Component B, shown in Example 1, along with 0.60 gms of the $M^HD_{121}M^H$ hydride fluid, and 0.6 gms of the $M^{Vi}D_{105}M^{Vi}$ vinyl fluid. This yielded a weight percent ratio of 55.1 MQ to 44.9 fluids and a SiH to SiVinyl ratio of 1.498.

After thorough mixing, the composition was coated with a wire-wound rod over a clear 25.4 µm (1 mil) polyester film, then cured for 3 minutes at 150°C. The cured silicone adhesive was 50.8 µm (2.0 mil) thick and had a Polyken tack adhesion of 616 gms/cm^2 and a peel adhesion of 36.8 g/mm oz/in) against the steel plate. The haze after release at 90° was 24.2%, and 3.0% at 180° removal angle. These values are considered high for adhesive applications requiring good optics and finish.

EXAMPLES 3-5

A dimethylvinyl-stopped polydimethylsiloxane polymer of about 85,000 mPa.s (cps) viscosity at room temperature was used as a modifier to the basic composition illustrated in Example 1. For Examples 3 and 4, the basic composition mixture is prepared by mixing 10.0 gms of Component A with 14.25 gms of Component B, both shown in Example 1. To the total solids of the basic composition (as 100 parts) 5.2 and 9.7 parts by weight of the modifier were added, respectively. The final mixture had a SiH (silicon-bonded hydride) to SiV (also known as silicon-bonded vinyl) ratio of about 1.498. The base mixture in Example 5 consisted of 10.0 gms of Component A and 12.38 gms of Component B. In Example 5, 3.75 gms of the high viscosity polymer was added to produce 17.7 parts by weight additive per 100 parts by weight of the mixture of Components A and B. From these mixtures Cured silicone adhesive tapes were made on 25.4 µm (1 mil) polyester film. The corresponding peel, tack adhesion and removal property, in terms of % haze reading at both 90° and 180° angles are shown in Table 1 below. Significant reduction in % haze was obtained from the cured tapes.

TABLE I

Experiment Number	Viscosity of Modifier	Parts Additive	SiH/SiV Ratio	Weight Percent MQ
2	85 (M cps)Pa.s	0	1.498	55.1
3	85 (M cps)Pa.s	5.2	1.498	55.1
4	85 (M cps)Pa.s	9.7	1.498	52.9
5	85 (M cps)Pa.s	17.7	1.3	49.3
Experiment Number	Probe Tack gms/cm^2	Peel (Steel) (oz/in) g/mm	Release at 90° % Haze	Release at 180° % Haze
2	616	(33) 36.8	24.2	3
3	656	(29) 32.4	0.9	0.7
4	622	(22) 24.6	1.2	0.8
5	638	(19) 21.2	7.7	1

EXAMPLES 6-10

To optimize the viscosity range of useful control removal additives, a series of dimethylhydroxy-stopped polydimethylsiloxanes, of viscosity from 7600 mPa.s (cps) to as high as 8.6 x 10^6 mPa.s (cps) at room temperature were used as modifiers. In Example 6, a composition without modifier was made by mixing 10 g of Component A with 12.38 gms of Component B, both shown in Example 1. Examples 7 through 10 are compositions based on 100 parts by weight of the base composition in Example 6, with 5.6 parts by weight of modifier. Cured silicone pressure-sensitive adhesives were made from each of these compositions, according to the procedure in Example 2. All adhesives showed complete cure

and no residue upon testing. The test results are shown in Table II. The modifier-containing adhesives (Examples 7-10) had reasonable peel and tack adhesion and significant less haze at a 90° peel angle than what was observed in Example 6. The % haze readings at 180° peel angle suggest inherent contributions from a particular polyester film and cured adhesive mass.

TABLE II

Experiment Number	Viscosity of Modifier	Parts Additive	SiH/SiV Ratio	Weight Percent MQ
6		0	1.3	58
7	7600 (cps) mPa.s	5.6	1.3	54.9
8	30 (M cps)Pa.s	5.6	1.3	54.9
9	130 (M cps)Pa.s	5.6	1.3	54.9
10	8.59 (MM cps)mPa.s	5.6	1.3	54.9
Experiment Number	Probe Tack gms/cm^2	Peel (Steel) oz/in g/mm	Release at 90° % Haze	Release at 180° % Haze
6	704	(40) 44.6	8.5	1.9
7	632	(26) 29.0	3.2	2.1
8	676	(26) 29.0	3.5	1.8
9	684	(25) 27.9	4.6	2.5
10	770	(32) 35.7	5.9	2.6

EXAMPLE 11 - Epoxy-Containing Silicone Polymer

A silicone polymer containing epoxide (cyclohexeneoxide as derived from the reaction product of vinylcyclohexeneoxide with siliconhydride) with a viscosity of 1680 mPa.s (cps) was used at a ratio of 5.6 parts by weight to a 100 parts by weight solid of the base composition of Example 6. A completely cured pressure-sensitive adhesive tape of 45.7 µm (1.8 mil) thickness was obtained. The peel adhesion was 25.67 g/mm (23 oz/in), Polyken tack was 690 gms/cm^2, and a haze value of 7.3% was obtained at 90° removal angle. As compared to a reading of 8.5% for Example 6, silicone modifier of 1600 mPa.s (cps) showed some improvement over the one without any modifier in terms of minimizing surface and optics distortion.

EXAMPLES 12-14 - Alkyl-Terminated Silicone Polymers

To illustrate the option of using alkyl-stopped silicone polymers (up to 18 carbon atoms) as release modifiers, a polydimethylsiloxane polymer of 100,000 mPa.s (cps) viscosity was used at 0.99, 2.8, and 5.6 parts by weight per 100 parts by weight solid of the base composition in Example 6. All compositions were cured to yield residue-free, silicone adhesives with improved removal property. The effect in reducing the % haze was observed at as low as 1 part by weight additive per 100 parts by weight solid of the base composition in Example 6. Table III below shows the properties of these compositions.

TABLE III

Experiment Number	Viscosity of Modifier	Parts Additive	SiH/SiV Ratio	Weight Percent MQ
12	100 (M cps) Pa.s	0.99	1.3	57.4
13	100 (M cps) Pa.s	2.8	1.3	56.4
14	100 (M cps) Pa.s	5.6	1.3	54.9
Experiment Number	Probe Tack gms/cm^2	Peel (Steel) (oz/in) g/mm	Release at 90° % Haza	Release at 180° % Haza
12	686	(37) 41.3	6.1	2.2
13	636	(26) 29.0	1.8	1
14	644	(22) 24.6	4.4	0.2

EXAMPLES 15-16 - Fluorosilicone Polymers

The effects of the partial miscibility of the release modifier with the base composition of MQ resin, silicone fluids

and/or polymers and Pt-catalyst is shown in these Examples 15 and 16. The effectiveness of the modifier in reducing the % haze or surface distortion associated with removal or dispensing is greatly reduced without at least partial miscibility . In Example 15, a dimethylhydroxy-stopped fluorosilicone polymer of 100,000 mPa.s (cps) viscosity was used at 5.6 parts by weight per 100 parts by weight of the base composition. In Example 16, a vinyl-stopped copolymer of dimethyl silicone and trifluoropropylmethylsilicone of 29,000 mPa.s (cps) was used at 5.6 parts by weight per 100 parts by weight of the base composition. The % haze of 90° angle peeled tapes had readings of 9.4 and 12.5, respectively. The higher % haze in Example 16 was the result of less chemical miscibility with the base material before cure.

Claims

1. A pressure sensitive adhesive, having improved control removal properties, said adhesive comprising a resin/organopolysiloxane composition curable to produce a pressure sensitive adhesive said organopolysiloxane composition curable to produce a pressure sensitive adhesive comprising about 50 to about 75 parts by weight of a benzene toluene-soluble siloxane resin, about 25 to about 50 parts by weight of vinyl- and hydride-containing organopolysiloxanes, a Pt catalyst, and from 0 to about 40 weight percent organic solvent and from about 0.5 to about 15 weight percent based upon the resin/organopolysiloxane composition of a chemically compatible high molecular weight organopolysiloxane having the general formula :

$$RR^1{}_2SiO(R^1{}_2SiO)_x(RR^2SiO)_ySiR^1{}_2R \quad (1)$$

wherein each R^1 is independently an alkyl or aryl group having from 1 to about 10 carbon atoms, each R^2 is independently an alkyl or aryl group having from 1 to about 10 carbon atoms, each R is independently chose from R^1 or R^2, x is an integer, and y is an integer, x and y having values such that the chain-length dependent viscosity of the chemically compatible high molecular weight polyorganosiloxane is at least 1500 mPa.s (cps) at 25°C.

2. A pressure sensitive adhesive as in Claim 1, wherein said chemically compatible high molecular weight organopolysiloxane is present in an amount of between 2 and 10 weight percent.

3. A pressure sensitive adhesive as in Claim 1, wherein x and y are such that the chain-length dependent viscosity of said chemically compatible high molecular weight organopolysiloxane is at least 10,000 mPa.s (cps) at 25°C.

4. A pressure sensitive adhesive as in Claim 1, wherein said chemically compatible high molecular weight organopolysiloxane comprises an alkyl-terminated silicone polymer.

5. A pressure sensitive adhesive as in Claim 6, wherein said chemically compatible high molecular weight organopolysiloxane comprises a polydimethylsiloxane.

6. A pressure sensitive adhesive as in Claim 4, wherein said alkyl-terminated silicone polymer is present in an amount of between 2 parts by weight and 10 parts by weight based on 100 parts by weight of the organopolysiloxane composition curable to produce a pressure sensitive adhesive.

Patentansprüche

1. Haftkleber mit besser kontrollierten Entfernungseigenschaften, wobei der Klebstoff eine Harz/Polyorganosiloxan-Zusammensetzung umfaßt, die unter Erzeugung eines Haftklebers härtbar ist, wobei die unter Erzeugung eines Haftklebers härtbare Polyorganosiloxan-Zusammensetzung etwa 50 bis etwa 75 Gewichtsteile eines benzol/toluollöslichen Siloxanharzes, etwa 25 bis etwa 50 Gewichtsteile vinyl- und hydrid-haltiger Polyorganosiloxane, einen Pt-Katalysator und von 0 bis etwa 40 Gew.-% organisches Lösungsmittel sowie von etwa 0,5 bis etwa 15 Gew.-%, bezogen auf die Harz/Polyorganosiloxan-Zusammensetzung, eines chemisch verträglichen Polyorganosiloxans hohen Molekulargewichtes mit der allgemeinen Formel umfaßt:

$$RR^1{}_2SiO(R^1{}_2SiO)_x(RR^2SiO)_ySiR^1{}_2R \quad (1)$$

worin jedes R^1 unabhängig eine Alkyl- oder Aryl-Gruppe mit von 1 bis etwa 10 Kohlenstoffatomen, jedes R^2 unabhängig eine Alkyl- oder Aryl-Gruppe mit von 1 bis etwa 10 Kohlenstoffatomen, jedes R unabhängig von R^1 oder R^2 ausgewählt ist, x eine ganze Zahl ist, y eine ganze Zahl ist und x und y derartige Werte haben, daß die von der Kettenlänge abhängige Viskosität des chemisch verträglichen Polyorganosiloxans hohen Molekulargewichtes min-

destens 1.500 mPa·s (cps) bei 25°C ist.

2. Haftkleber nach Anspruch 1, worin das chemisch verträgliche Polyorganosiloxan hohen Molekulargewichtes in einer Menge zwischen 2 und 10 Gew.-% vorhanden ist.

3. Haftkleber nach Anspruch 1, worin x und y derartige Werte haben, daß die von der Kettenlänge abhängige Viskosität des chemisch verträglichen Polyorganosiloxans hohen Molekulargewichtes mindestens 10.000 mPa·s (cps) bei 25°C ist.

4. Haftkleber nach Anspruch 1, worin das chemisch verträgliche Polyorganosiloxan hohen Molekulargewichtes ein Alkyl-Endgruppen aufweisendes Siliconpolymer umfaßt.

5. Haftkleber nach Anspruch 6, worin das chemisch verträgliche Polyorganosiloxan hohen Molekulargewichtes ein Polydimethylsiloxan umfaßt.

6. Haftkleber nach Anspruch 4, worin das Alkyl-Endgruppen aufweisende Siliconpolymer in einer Menge zwischen 2 und 10 Gewichtsteilen, bezogen auf 100 Gewichtsteile der unter Erzeugung eines Haftklebers härtbaren Polyorganosiloxan-Zusammensetzung, vorhanden ist.

Revendications

1. Adhésif sensible à la pression, présentant des propriétés améliorées d'enlèvement réglé, ledit adhésif comprenant une composition durcissable constituée par un organopolysiloxane et une résine pour produire un adhésif sensible à la pression, ladite composition d'organopolysiloxane durcissable pour produire un adhésif sensible à la pression comprenant environ 50 parties à environ 75 parties en poids d'une résine de siloxane soluble dans le toluène et le benzène, environ 25 à environ 50 parties en poids d'hydrogénopolyorganosiloxanes contenant des groupes vinyle, un catalyseur au platine, et 0 à environ 40% en poids de solvant organique, et environ 0,5 à environ 15% en poids, par rapport à la composition constituée par une résine et un organopolysiloxane, d'un organopolysiloxane chimiquement compatible, de masse moléculaire élevée, correspondant à la formule générale :

$$RR^1{}_2SiO(R^1{}_2SiO)_x(RR^2SiO)_ySiR^1{}_2R \qquad (I)$$

dans laquelle chaque R^1 représente indépendamment un groupe aryle ou alkyle comportant de 1 à environ 10 atomes de carbone, chaque R^2 représente indépendamment un groupe alkyle ou aryle comportant de 1 à environ 10 atomes de carbone, chaque R représente indépendamment un groupe choisi parmi R^1 ou R^2, x est un nombre entier, et y est un nombre entier, x et y ayant des valeurs telles que la viscosité, qui dépend de la longueur de la chaîne, du polyorganosiloxane chimiquement compatible, de masse moléculaire élevée, vaut au moins 1500 mPa.s (cps) à 25° C.

2. Adhésif sensible à la pression conforme à la revendication 1, dans lequel ledit organopolysiloxane chimiquement compatible, de masse moléculaire élevée, est présent en une quantité comprise entre 2 et 10% en poids.

3. Adhésif sensible à la pression conforme à la revendication 1, dans lequel x et y sont tels que la viscosité, qui dépend de la longueur de la chaîne, dudit organopolysiloxane chimiquement compatible, de masse moléculaire élevée, vaut au moins 10 000 mPa. s (cps) à 25° C.

4. Adhésif sensible à la pression conforme à la revendication 1, dans lequel ledit organopolysiloxane chimiquement compatible, de masse moléculaire élevée, comprend un polymère de silicone à groupes terminaux alkyle.

5. Adhésif sensible à la pression conforme à la revendication 1, dans lequel ledit organopolysiloxane chimiquement compatible, de masse moléculaire élevée, comprend un polydiméthylsiloxane.

6. Adhésif sensible à la pression conforme à la revendication 4, dans lequel ledit polymère de silicone à groupes terminaux alkyle est présent en une quantité comprise entre 2 parties en poids et 10 parties en poids par rapport à 100 parties en poids de la composition d'organopolysiloxane durcissable pour produire un adhésif sensible à la pression.